SESSION V:

LIGHT SEARCH AND RESCUE OPERATIONS

LIGHT SEARCH AND RESCUE OPERATIONS

SESSION V

LIGHT SEARCH AND RESCUE OPERATIONS

TIME: 2 hours 30 minutes

OBJECTIVES

At the conclusion of this session, the participants will be able to:

1. Identify planning and size-up requirements for potential search and rescue situations.
2. Describe the most common techniques for searching a structure.
3. Use safe techniques for debris removal and victim extrication.
4. Describe ways to protect rescuers during search and rescue.

SCOPE

- Introduction And Session Overview
- Planning
- Search And Rescue Size-Up
- Conducting Search Operations
- Conducting Rescue Operations
- Session Summary

TRAINING METHODS

The lead instructor will begin this session by welcoming the participants to Session V: Light Search And Rescue Operations, and will introduce the instructors for the session. The instructor will then present a brief overview of this session, including making the distinction between search and rescue, the goals of search and rescue, search and rescue priorities, and the steps involved in effective search and rescue.

Next, the instructor will explain the importance of pre-disaster planning to identify types of occupancies that may be affected, and the resources (personnel, tools, and equipment) that may be required for search and rescue operations in those types of occupancies. Participants will complete a preplanning exercise using a locally prepared disaster scenario.

TRAINING METHODS (Continued)

Next, the instructor will review the size-up process as it applies to search and rescue. At this time, the instructor will emphasize the most dangerous construction-related hazards and identify any particularly dangerous structures in the community. The instructor will emphasize the importance of rescuer safety in all size-up decisions. Participants will complete size-up exercises using either the scenarios provided or locally prepared scenarios.

The next topic of this session will deal with search techniques for locating potential victims. The instructor will identify the types of voids that may be created through structural collapse and the methods that searchers can use for locating victims and docu-menting their positions.

Finally, the instructor will describe rescue techniques and methods for lifting, debris removal, and finally, victim removal. The instructors will demonstrate leveraging and cribbing. The instructors will also demonstrate using lifts and drags as victim removal techniques, and the participants will practice those techniques under instructor observation. At the end of this section, the group will participate in a simulation involving both debris removal and victim removal.

REFERENCES

Community Emergency Response Team Instructor Guide
Community Emergency Response Team Participant Handbook
Visuals 5.1 through 5.23

LIGHT SEARCH AND RESCUE OPERATIONS

EQUIPMENT

In addition to the equipment listed at the front of this Instructor Guide, you will need the following equipment for this session:

- 1 mannequin.
- 1 blanket.
- 2 poles that can be used for an improvised stretcher.
- 2 jackets.
- Large, flat object (e.g., table) and pieces of wood for leveraging/cribbing

PREPARATION

For the exercises in this session on **Planning** and **Gathering Facts**, scenarios have already been developed. Copies of the scenarios appear in the Participant Handbook, and are included in this Guide at the end of the materials for this session. You should feel free to alter these scenarios to reflect the community's needs.

The exercise in this session on **Search And Rescue Size-up** requires the preparation of scenarios that are realistic for your community. Be sure to prepare the scenarios in advance of the session and have copies for each participant. Include the following types of information in the scenarios:

- Type of event
- Intensity/severity/duration
- Occupancy affected
- Current/forecast weather conditions
- Time of day and week
- Other factors that may affect search and rescue operations

Water Rescues. Water rescues are not covered in any depth in this session. If water rescues are likely to be required in your local area because of the potential for flooding, develop additional information and exercises for this topic for presentation during this session.

LIGHT SEARCH AND RESCUE OPERATIONS

PREPARATION (Continued)

Probable Damage. Information that is provided about assessment of probable damage in relation to types of construction focuses primarily on earthquake damage. If other types of disasters (e.g., tornadoes, hurricanes, or floods) are likely to occur in your area, obtain and add information about probable impact on various types of construction.

NOTES

Remember as you work through this session with the group to stress the role of the CERT in search and rescue. The participants *must* come away from the training with an understanding of their limitations, and the attitude that their safety is paramount even above that of the victims.

A suggested time plan for this unit is as follows:

Introduction And Session Overview .....5 minutes
Planning.....30 minutes
    Exercise: Planning
Search And Rescue Size-Up .....45 minutes
    Exercise: Gathering Facts
    Exercise: Search And Rescue Size-Up
Conducting Search Operations.....20 minutes
Conducting Rescue Operations .....45 minutes
    Exercise: Leveraging, Cribbing, And Victim Removal
Session Summary .....5 minutes

Total Time: 2 hours 30 minutes

LIGHT SEARCH AND RESCUE OPERATIONS

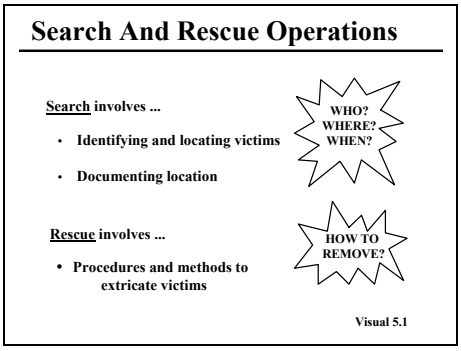
INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

Total Topic: 2 hours 30 minutes

Total Topic: 5 minutes

Participant Handbook, page PH V-3.

Visual 5.1



Use the example from the earthquake in Mexico City, where spontaneous efforts saved 800 lives—but cost the lives of over 100 people—to add emphasis to this discussion.

SESSION V: LIGHT SEARCH AND RESCUE OPERATIONS

INTRODUCTION AND SESSION OVERVIEW

- Welcome the participants to Session V of the CERT training program.
- Introduce the instructors for this session and ask any new instructors to briefly describe their experience with search and rescue operations.
- Introduce this section by explaining that search and rescue are two separate operations:
  - Search involves identifying and locating victims and documenting their location.
  - Rescue involves the procedures and methods required to extricate the victims.
- Explain that experience from previous disasters has shown that immediately after almost every disaster, the first response to trapped victims is by spontaneous, untrained, and well-intentioned persons who rush to the site of a collapse in an attempt to free the victims.
- Emphasize that, more often than not, these spontaneous rescue efforts result in serious injuries and compounded problems.

INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

INTRODUCTION AND SESSION OVERVIEW (Continued)

Visual 5.2

Decision To Attempt Rescue

- **Risks involved**
- **Greatest good for greatest number of people**

Visual 5.1

- Point out that, however well-meaning, rescue efforts should be planned and practiced in advance—and the decision to attempt a rescue should be based on two factors:
  - The risks involved.
  - The overall goal of doing the greatest good for the greatest number of people.

Visual 5.3

Objectives Of Search And Rescue

- **Acknowledge: most important person is rescuer**
- **Rescue greatest number in shortest amount of time**
- **Rescue lightly trapped victims first**

Visual 5.3

- Explain that the objectives of search and rescue operations are to:
  - Acknowledge that the most important person in a rescue attempt is the rescuer.
  - Rescue the greatest number of people in the shortest amount of time.
  - Rescue lightly trapped victims first.

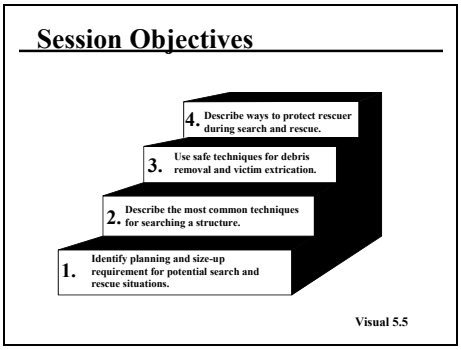
Visual 5.4

Effective Search And Rescue

- **Effective planning**
- **Effective size-up**
- **Rescuer safety**
- **Victim safety**

Visual 5.4

- Explain that effective search and rescue operations hinge on:
  - Effective planning.
  - Effective size-up.
  - Rescuer safety.
  - Victim safety.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	INTRODUCTION AND SESSION OVERVIEW (Continued)
	▪ Tell the participants that this session will focus on the components of an effective search and rescue operation—planning, size-up, search, and rescue—and the methods and techniques that rescuers can use to locate and safely remove victims.
	SESSION OBJECTIVES
Visual 5.5  	▪ Tell the participants that at the end of this session, they will be able to: • Identify planning and size-up requirements for potential search and rescue situations. • Describe the most common techniques for searching a structure. • Use safe techniques for debris removal and victim extrication. • Describe ways to protect rescuers during search and rescue.
	SUMMARY AND TRANSITION
? *Discussion question.*	▪ Ask if anyone has any questions about what will be covered in this session.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY

Total Topic: 30 minutes

Visual 5.6

Planning

- **Assessing probable needs and risks**
- **Assessing resources**
- **Developing an action plan**

Needs and risks are determined by the types of occupancies.

Visual 5.6

Participant Handbook, page PH V-6.

Identify some of the different occupancies in the local area.

PLANNING

- Introduce this section by telling the participants that planning involves:
  - Assessing probable needs and risks.
  - Assessing resources.
  - Developing an action plan that considers the needs, risks, and resources.

ASSESSING NEEDS AND RISKS

- Point out that needs and risks are determined to some extent by the types of occupancies in the local area.

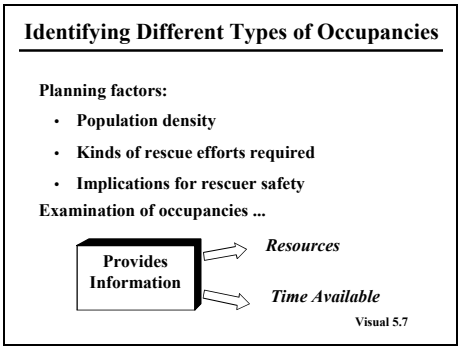
- Emphasize that the term *occupancies* does not necessarily mean houses. It also refers to anyplace where people might be during a disaster:
  - Apartments, condominiums, and mobile homes.
  - Industrial, commercial, or office space.
  - Schools.
  - Places of worship.
  - Hospitals and nursing homes.
  - Airports.

INSTRUCTORS NOTES

CONTENTS/ACTIVITY

ASSESSING NEEDS AND RISKS (Continued)

Visual 5.7



- Tell the group that part of search and rescue planning involves identifying the different types of occupancies in the local area and asking:
  - What does this mean in terms of population density?
  - What does it mean for the kinds of rescue efforts that may be required?
  - What are the implications for rescuer safety?

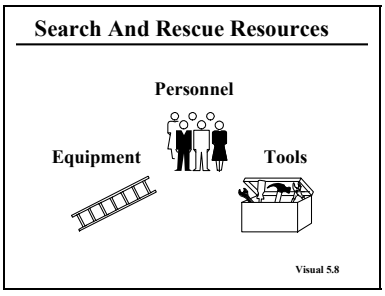
Provide locally relevant examples of these questions.

- Stress that careful examination of the types of occupancies that may be involved in a disaster will provide valuable information about:
  - The resources that may be required.
  - The amount of time that may be available for search and rescue operations.

ASSESSING RESOURCES

- Explain to the participants that the *first* step in search and rescue operations is to identify local resources *before* the disaster.

Visual 5.8

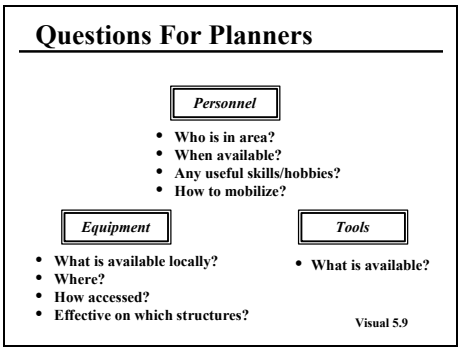


- Tell the group that search and rescue resources include:
  - Personnel
  - Equipment
  - Tools

INSTRUCTORS NOTES

Participant Handbook, page PH V-8.

Visual 5.9



Give the participants examples of equipment and tools they might need, to get them started thinking about availability of resources.

CONTENTS/ACTIVITY

ASSESSING RESOURCES (Continued)

- Refer the participants to their Participant Handbooks, where they will find questions to guide their resource planning efforts.

- Explain that some of the questions that CERT planners should ask about resources include:

  - *Personnel:*

    - Who lives and/or works in the area?
    - During which hours are these people most likely to be available?
    - What skills or hobbies do they have that might be useful in search and rescue operations?
    - What might be the most effective means of mobilizing their efforts?

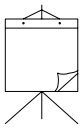
  - *Equipment:*

    - What equipment is available locally that might be useful for search and rescue?
    - Where is it located?
    - How can it be accessed?
    - On which structures (or types of structures) might it be most effective?

  - *Tools:*

    - What tools are available that might be useful for lifting, moving, or cutting disaster debris?

LIGHT SEARCH AND RESCUE OPERATIONS

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	ASSESSING RESOURCES (Continued) ▪ Point out that considering each of these questions during planning will facilitate actual search and rescue efforts.
 *Total Exercise: 15 minutes*	**EXERCISE: PLANNING** Instructor Note: This exercise is an interactive planning activity to give the participants an opportunity to consider some of the planning activities required for CERT search and rescue operations. Use the following steps to facilitate this exercise:
 *Participant Handbook, page PH V-41.*	1. Refer the participants to Scenario V-1, located at the back of Module V in the Participant Handbook. 2. Ask the group to brainstorm search and rescue priorities for the scenario, including: • What kinds of search and rescue operations are probable? • What, if any, are the constraints that search and rescue personnel may face in this scenario? • Can these constraints be overcome within the established mission for CERTs? If so, how?
This scenario is an example; you should feel free to change the scenario to meet the community's needs.	
 *Record participants' responses on flipchart.*	3. Record the group's responses on a flipchart. 4. Discuss the group's responses and provide feedback on how their planning might be improved.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
? *Discussion question.*	**SUMMARY AND TRANSITION** ▪ Ask the group if anyone has any questions about the search and rescue planning factors. ▪ Explain that the next section will deal with search and rescue size-up.
YOUR NOTES:	

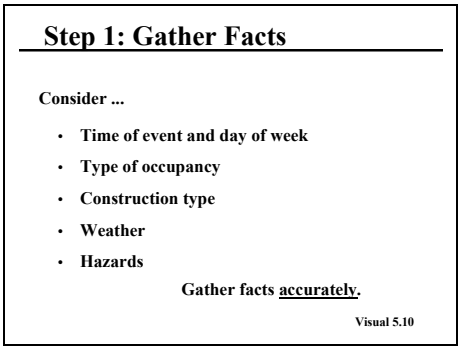
LIGHT SEARCH AND RESCUE OPERATIONS

INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

Total Topic: 40 minutes

Participant Handbook, page PH V-9.

Visual 5.10



Participant Handbook, page PH V-10.

Provide and discuss locally relevant examples of planning factors, to develop an understanding of the effects of each factor.

SEARCH AND RESCUE SIZE-UP

- Remind the participants that, like every other CERT operation, search and rescue requires size-up at the beginning of the operation and continuously as long as the operation continues.

- Tell the group that search and rescue size-up is a seven-step process. Refer the participants to their Participant Handbooks, and review the steps as necessary. Tell the group that this section will focus on the preliminary tasks of gathering facts and assessing damage to the building.

STEP 1: GATHER FACTS

- Tell the group that the facts of the situation must guide their search and rescue efforts. Refer the participants to their Participant Handbooks. When gathering facts, they need to consider:

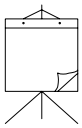
  - *The time of the event and day of the week.* At night, more people will be in their homes, so the greatest need for search and rescue will be in residential settings. Conversely, during the day people will be at work, so the need will be in commercial buildings.

    Some emergency services are not available—or not available in the same numbers—during the evenings or on weekends. Search and rescue operations may also be affected by where people are located in their homes and the amount of daylight available.

  - *The type of occupancy.* The purpose for which the structure was designed may indicate the likely number of victims, and their location.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
Mention that the amount of damage likely to be found in different types of construction will be covered in a few minutes.	**STEP 1: GATHER FACTS** (Continued) • *Construction type.* Some types of construction are more susceptible to damage than others. • *Weather.* Severe weather will have an effect on victims and rescuers alike and will certainly hamper rescue efforts. Forecasts of severe weather should be considered as a limiting factor on the time period during which search and rescue can occur. • *Hazards.* Knowledge of other potential hazards in the general and immediate areas is important to search and rescue efforts. Time lost trying to locate and shut off utilities, for example, can have a big impact in terms of loss of life. ▪ Stress the need for accurate fact-gathering before attempting to assess damage.
YOUR NOTES:	

LIGHT SEARCH AND RESCUE OPERATIONS

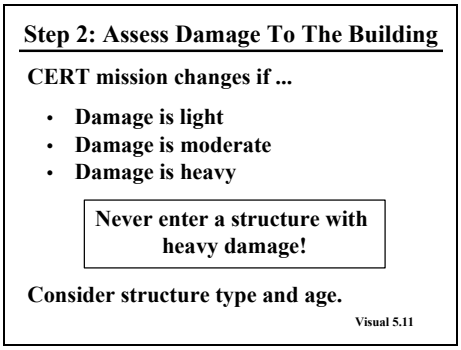
INSTRUCTORS NOTES	CONTENTS/ACTIVITY
 *Total Exercise: 15 minutes*	**EXERCISE: GATHERING FACTS**
	Instructor Note: This exercise is an interactive activity to give the participants the opportunity to consider some of the facts that CERT search and rescue teams will need to gather during size-up. Use the following steps to facilitate this exercise:
 *Participant Handbook, page PH V-42.*	1. Refer the participants to Scenario V-2 at the end of Module V in the Participant Handbook.
This scenario is an example; you should feel free to change the scenario to fit the community's needs.	2. Explain that Scenario V-2 is a continuation of Scenario V-1.
	3. Ask the group to brainstorm the following questions: • What does this scenario tell you about the facts that must be gathered? • What impact could these facts have on search and rescue operations?
 *Record participants' responses on flipchart.*	4. Record the group's responses on a flipchart.
? *Discussion question.*	5. Discuss the group's responses and provide feedback on how their planning might be improved.

YOUR NOTES:

INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

Participant Handbook, page PH V-11.

Visual 5.11



Slides showing light, moderate, and heavy damage from Session I may also be used here for illustration purposes.

Mention that in the next session the participants will learn more about formulating rescue strategies based on damage assessment.

STEP 2: ASSESS DAMAGE TO THE BUILDING

- Point out that there are no hard and fast rules for assessing damage. Emphasize, however, that the CERT mission changes depending on the amount of structural damage (refer the participants to their Participant Handbooks):

  - *If damage is light* (superficial or cosmetic damage) . . .

    . . . Then the CERT mission is to locate, triage, and prioritize removal of victims.

  - *If damage is moderate* (questionable structural stability, fractures, tilting, foundation movement or displacement) . . .

    . . . Then the CERT mission is to locate, stabilize, and immediately evacuate victims to a safe area while minimizing the number of rescuers inside the structure.

  - *If damage is heavy* (obvious structural instability with partial or total wall collapse or ceiling failure) . . .

    . . . Then the CERT mission is to secure the building perimeter and control access into the structure by untrained personnel.

- Warn the participants that they must not enter a building with heavy damage *under any circumstances.*

- Warn that the participants must look at a building from all sides by doing a "lap around."

INSTRUCTORS NOTES	CONTENTS/ACTIVITY

STEP 2: ASSESS DAMAGE TO THE BUILDING (Continued)

Instructor Note: The following information on probable damage relates to earthquakes. If other types of disasters (e.g., tornadoes, hurricanes, or floods are likely in your area, add information about the probable impact on various types of construction.

Participant Handbook, page PH V-12.

- Tell the group that after—or in conjunction with—the damage assessment, CERT personnel must consider probable amounts of damage based on the type and age of construction. Explain that experienced search and rescue personnel can determine probable damage to a structure based on the event and the types of structures involved. Refer the participants to their Participant Handbooks.

Throughout this section, mention neighborhoods containing these types of structures or specific structures if they are prominent in the community.

Probable Damage from Earthquakes

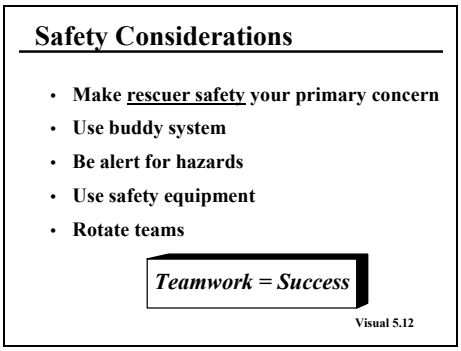
- *For single-family dwellings that are/were:*
  - Wood frame: Expect light damage, usually to masonry and utilities.
  - Built before 1933: Expect moderate damage: some foundation movement, utility damage, and possibly porch collapse.
  - Built on a hillside: Expect ground failure, and consider the damage severe. These structures may have unique hazards.
- *For multiple-family dwellings:* Expect moderate damage: soft first floor and some utility damage.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
Point out any structures in the community that have these characteristics.	**STEP 2: ASSESS DAMAGE TO THE BUILDING** (Continued) • *For pre-1933 unreinforced brick that is constructed from lime or sand mortar, has bricks turned on edge every 5-7 rows, and/or has reinforcing plates:* Expect heavy damage. Look for heavy damage to arched and/or recessed windows and doors. The walls are subject to collapse first, then the roof. **WARNING: Warn the participants that these structures are extremely unstable. CERT search and rescue teams must treat these structures as receiving heavy damage—even if damage appears to be less severe.** • *For tilt-up structures, such as large warehouses and plants built on concrete slabs with walls inset 6-8 inches:* Expect heavy damage. The lightweight roof construction in these structures makes them subject to collapse. • *For high-rise construction:* Expect damage to be light. Because these structures are reinforced, main damage will be due to broken glass, content movement, and breakaway of exterior trim and/or facia.
YOUR NOTES:	

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
Participant Handbook, page PH V-13. *Develop a scenario based on a structure in your local area and have the participants as a group discuss the steps that should be taken before and during a rescue attempt.*	**REMAINING SIZE-UP STEPS** ▪ Next, briefly review with the participants the remaining steps involved in search and rescue size-up: • Step 3: Identify Resources: Identify personnel, equipment, and tools available to assist in rescue efforts. • Step 4: Establish Rescue Priorities: Evaluate the situation at hand to determine what should be done, and in what order. • Step 5: Develop Rescue Plan: Decide specifically how the team will complete the tasks to which they have assigned the highest priority. • Step 6: Conduct The Rescue: Put the plan into action. • Step 7: Evaluate Progress: Continually monitor the situation to ensure rescuer safety and effectiveness of the plan. Instructor Note: Stress to the group that this last step is the most important from a safety stand-point.

INSTRUCTORS NOTES

Visual 5.12



Participant Handbook, page PH V-14.

CONTENTS/ACTIVITY

SAFETY CONSIDERATIONS

- Tell the group that regardless of the severity of structural damage, rescuer safety must be the primary concern.

- The two most frequent causes of rescuer deaths are:

  - Disorientation.
  - Secondary collapse.

- Refer the participants to their Participant Handbooks. Caution the participants that they must follow these guidelines during all search and rescue operations:

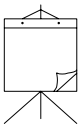
  - Use a buddy system. Always work in pairs, with a third person acting as a runner.

  - Be alert for hazards (for example, power lines, leaking natural gas, hazardous materials, sharp objects).

    Caution the group that if they are considering a search in an area where water is present, they must determine whether the water level is constant, increasing, or decreasing. *Never* enter an area in which the water level is rising. Check the depth with a probe before stepping into the water. Probe before each step to check depth and identify underwater objects that may trip or entrap you. Do *not* enter a water environment unless you are certain that it is safe.

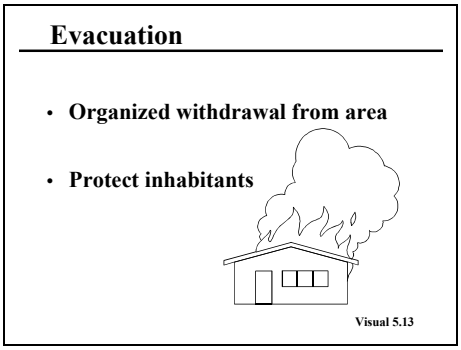
SAFETY CONSIDERATIONS (Continued)

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	• Use safety equipment. Wearing gloves will protect a rescuer's most valuable tool—his or her hands. Tell the group that the primary cause of rescuer problems after working in a structural collapse is breathing dust, so a dust mask is essential. However, warn the group that a dust mask will *not* filter out harmful materials. • Have back-up teams available. This allows rotating of teams, prevents fatigue, and ensures help if a team gets into trouble. Have teams drink fluids and eat to keep themselves fresh. ▪ Remind the group that successful search and rescue depends on teamwork.
 *Total Exercise: 15 minutes* *You are encouraged to have slides of local buildings to heighten the reality of the scenario.*  *Divide participants into small groups.*	**EXERCISE: SEARCH AND RESCUE SIZE-UP** Instructor Note: This exercise is an interactive activity to give the participants an opportunity to practice some of the thinking processes involved in planning and search and rescue size-up. The brainstorming required will help the participants to begin to assess their neighborhoods in terms of building structures, hazardous materials, safety precautions that need to be taken, etc. The exercise will be based on several different types of local occupancies (one for each small group) for the most probable type of disaster the community will face. Use the following steps to facilitate this exercise: 1. Divide the participants into groups of four or five.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
 *Provide a local scenario. Show slides, if possible.*	**EXERCISE: SEARCH AND RESCUE SIZE-UP** (Continued)
 *Participants record responses on flipchart.*	2. Provide each group with a scenario describing a local occupancy in a disaster event that is realistic for the community. 3. Ask the groups to designate a recorder and, given the disaster and the specific building, answer the following questions: • What are the pertinent facts that must be gathered? • What kind of prediction can you make regarding damage, based on the disaster and the building construction? • What probable search and rescue problems can you identify? • What specific safety considerations can you identify? 4. Ask each group to select a spokesperson to present the group's response. 5. Discuss each group's responses and provide feedback about how their search and rescue size-up might be improved.
YOUR NOTES:	

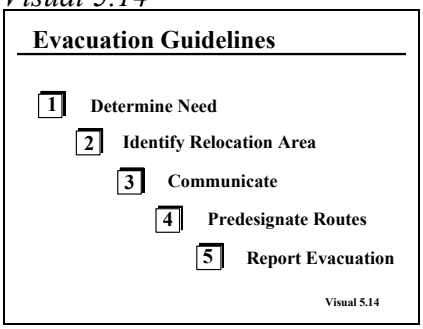
INSTRUCTORS NOTES

Visual 5.13



Participant Handbook, page PH V-15.

Visual 5.14



CONTENTS/ACTIVITY

EVACUATION

- Tell the participants that as a result of size-up it may be determined that evacuation is necessary. Evacuation is the organized withdrawal from an area for purposes of protecting the safety of the area's inhabitants.

- Explain that evacuation may be conducted as part of the search and rescue operation.

- Provide the following steps as guidelines in the event that an evacuation becomes necessary. Refer the participants to their Participant Handbooks.

  - Step 1: Determine the need. Determine whether there is a need for total or partial evacuation.

  - Step 2: Identify a relocation area. Select an area that is free of hazards and easily accessible. If possible, relocate to a pre-designated shelter.

  - Step 3: Communicate. Communicate to everyone involved the need to evacuate and the locations of the shelters.

  - Step 4: Predesignate routes. Designate routes from the area to be evacuated to the area of relocation. Consider alternatives.

  - Step 5: Report the evacuation. Be sure to inform emergency management personnel that the evacuation is taking place.

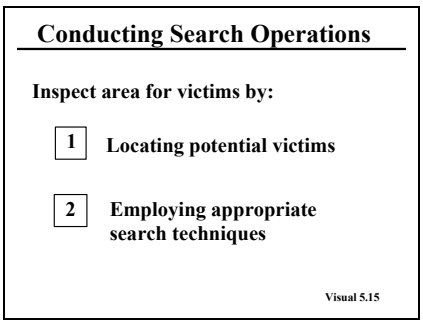
  Remind the group that following these guidelines will make the evacuation more orderly and prevent duplication of effort and additional risk.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	SUMMARY AND TRANSITION
? *Discussion question.*	▪ Ask the group if anyone has any questions about anything covered to this point in the session. ▪ Explain that the next section will deal with how to conduct search operations.
YOUR NOTES:	

INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

Total Topic: 20 minutes

Visual 5.15



Participant Handbook, page PH V-16.

CONDUCTING SEARCH OPERATIONS

- Introduce this section by telling the participants that once the decision is made to initiate search operations, CERT members must inspect the area assigned by the CERT Area Team Leader for victims. Explain that the search operation involves two processes:
  - Locating potential victims.
  - Employing search techniques appropriate to the operation.
- Explain that by using these processes, search operations will be more efficient, thorough, and safe. They will also facilitate later rescue operations. Explain also that, although the processes are related, this section will address them one at a time.

LOCATING POTENTIAL VICTIMS

- Tell the participants that the first step in locating potential victims is to conduct a "mini-size-up" to gather more precise information about damage and to develop priorities and plans.

Provide examples of how to use the information gathered to find out more information about areas of entrapment.

- Explain by saying that the data gathered will provide more information about areas of entrapment—or *voids.*

INSTRUCTORS NOTES	CONTENTS/ACTIVITY

Participant Hand-book, page PH V-17.

If you wish, use a visual demonstration to illustrate the various effects of a building collapse. Lincoln Logs or building blocks are suggested.

LOCATING POTENTIAL VICTIMS (Continued)

- Point out that there are several types of voids (refer the participants to their Participant Handbooks for illustrations of each type of void):
  - *Pancake voids* are most common in pre-1933 buildings. They are created by weakening or destruction of load-bearing walls, allowing floors to collapse onto each other. Pancake voids are the most difficult and time-consuming to search.
  - *Lean-to voids* are created when a collapsed wall or floor is resting against an outside wall. A victim trapped in a lean-to void has the greatest chance of being alive.
  - *"V" voids* are created by a "V" collapse of a floor or wall (the middle collapses and the ends lean against the outside wall).
  - *Individual voids* are spaces into which the victim may have crawled for protection, such as under a desk or in a bathtub.
- Tell the group that after identifying the possible areas of entrapment, CERT members must:
  - Determine the potential number of victims.
  - Identify the most probable areas of entrapment.
- Point out that some of this information may be known through planning, but CERT members may need to get some information by talking to bystanders or those who are familiar with the structure.

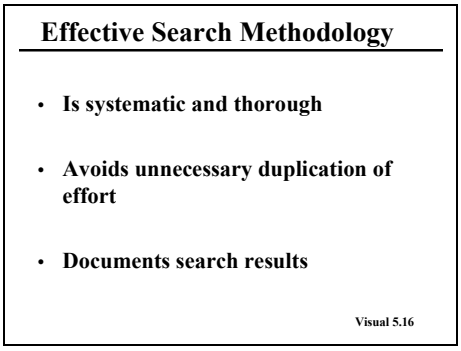
INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

LOCATING POTENTIAL VICTIMS (Continued)

- Questions that CERT members should ask when talking with these individuals include:
  - How many people live (or work) in the building?
  - Where would they be at this time?
  - What is the building layout?
  - What have you seen or heard?
  - Has anyone come out?
  - What are the normal exit routes from the building?
- Caution the group that bystanders may be confused by the event. They may tend to exaggerate potential numbers or may not even remember the event accurately. Tell the group to gather as much information as they can, though, because it will be useful for planning search priorities and implementing the search.

SEARCH METHODOLOGY

Visual 5.16

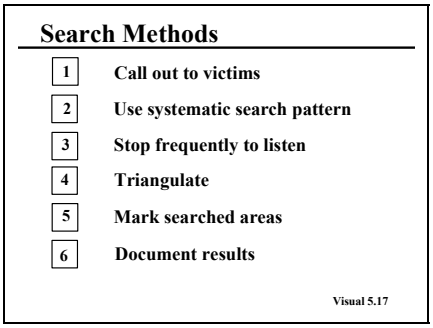


- Introduce this section by telling the group that an effective search methodology:
  - Is systematic and thorough.
  - Avoids unnecessary duplication of effort.
  - Documents search results.

INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

SEARCH METHODOLOGY (Continued)

Visual 5.17



Participant Handbook, page PH V-19.

- Tell the group that experienced search and rescue personnel have found these search methods to be effective:

  - *Begin the search by calling out to victims.* Shout something like, "If anyone can hear my voice, come here." If any victims respond, give them further directions such as "Stay here" or "Wait outside" (depending on the condition of the building). Ask victims who respond for any information they may have about the building or others who may be trapped.

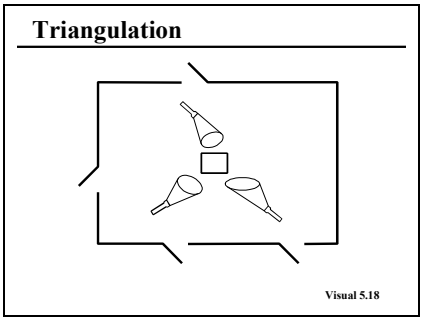
  - *Use a systematic search pattern.* Ensure that all areas of the building are covered. Exam-ples of systematic search patterns to use include:

    - Bottom-up/top-down.
    - Right wall/left wall.

  - *Stop frequently to listen.* Listen for tapping, movement, or voices.

  - *Triangulate.* Triangulation enables rescuers to view a single location from several perspectives. Three rescuers, guided by victim sounds, form a triangle around the area and direct flashlights into the area. The light shining from different directions will eliminate shadows that could otherwise hide victims.

Visual 5.18

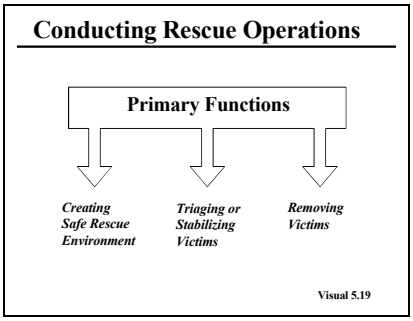


INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	SEARCH METHODOLOGY (Continued) • *Mark searched areas.* Make a single diagonal slash on or next to the door just before entering a structure. Make an opposite slash (creating an "X") when all occupants have been removed and search and rescue efforts have been completed. The "X" signals other potential searchers that the area has already been searched. This method: - Prevents duplication of effort. - Indicates rescuer location. • *Document results.* Keep complete records both of removed victims and of victims who remain trapped or are dead. Report this information to emergency services personnel when they reach the CERT.
Demonstrate search methods.	Instructor Note: Following this review of search methods, the instructor(s) should demonstrate how to conduct a search in a room, including search patterns (e.g., right wall/left wall) and marking doors. The demonstration can be done in any room; tables, chairs, and other items can be used to simulate debris.
	SUMMARY AND TRANSITION
? *Discussion question.*	▪ Ask the participants if anyone has any questions about the procedures for planning and conducting search operations or the methods involved in an effective search. ▪ Tell the participants that the next section will deal with conducting rescue operations.

INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

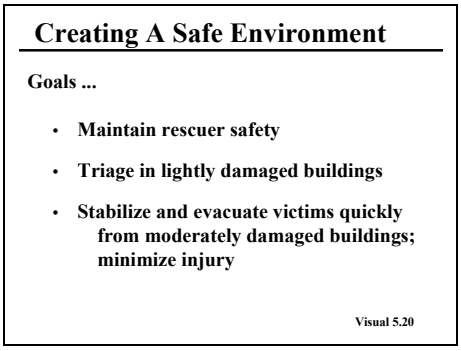
Total Topic: 45 minutes

Visual 5.19



Participant Handbook, page PH V-23.

Visual 5.20



CONDUCTING RESCUE OPERATIONS

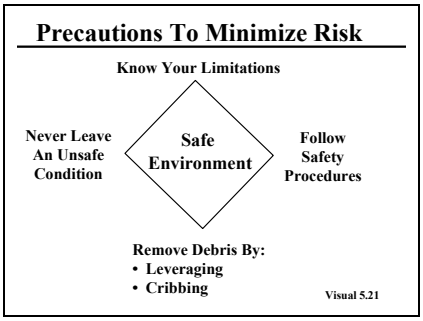
- Introduce this section by telling the participants that rescues involve three primary functions:
  - *Creating a safe rescue environment* by lifting objects out of the way, using tools to move objects, shoring up walls, and removing debris.
  - *Triaging or stabilizing victims.*
  - *Removing victims* in a moderately damaged building. Call in the medical team in a lightly damaged building.
- Explain that each of these topics will be addressed separately.

CREATING A SAFE ENVIRONMENT

- Tell the participants that there are three goals for all rescue operations:
  - To maintain rescuer safety.
  - To triage in lightly damaged buildings.
  - To stabilize and evacuate victims as quickly as possible from moderately damaged buildings while minimizing additional injury.
- Emphasize that none of these goals can be achieved without creating as safe an environment as possible before attempting rescue. There are, therefore, certain precautions that rescuers must take to minimize risk:

INSTRUCTORS NOTES | **CONTENTS/ACTIVITY**

Visual 5.21



CREATING A SAFE ENVIRONMENT (Continued)

- *Know your limitations.* Many volunteers have been injured or killed during rescue operations because they did not pay attention to their own physical and mental limitations. CERT rescuers should take the time to eat, drink fluids, rest, and relax so that they can return with a clear mind and improved energy.

- *Follow safety procedures.* CERT members should always use the proper safety equipment required for the situation and follow established procedures, including:

  - Working in pairs.
  - Never entering an unstable structure.
  - Lifting by bending the knees, keeping the back straight, and pushing up with the legs.
  - Carrying the load close to the body.
  - Lifting and carrying no more than is reasonable.

  (Refer the participants to their Participant Handbooks for an illustration of proper body position for lifting.)

Participant Handbook, page PH V-24.

- Tell the participants that they may encounter situations in which debris needs to be moved in order to free victims. In these situations, CERT rescuers should consider leveraging and cribbing to move and stabilize the debris until the rescue is complete.

Participant Handbook, page PH V-25.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY

CREATING A SAFE ENVIRONMENT (Continued)

Demonstrate leveraging and cribbing for the group.

- *Leveraging* is accomplished by wedging a lever under the object that needs to be moved, with a stationary object underneath it to act as a fulcrum. When the lever is forced down over the fulcrum, the far end of the lever will lift the object.

- A *crib* is a framework of wooden or metal bars used for support or strengthening. *Box cribbing* means arranging pairs of wood pieces alternately to form a stable rectangle.

Participant Handbook, page PH V-43 through V-45.

These materials are also included in this Guide for your reference, starting on page IG V-47.

Refer the participants to the section titled "Additional Materials" in their Participant Handbooks for a description of a leveraging and cribbing operation and an illustration of procedures for box cribbing.

- Explain that leveraging and cribbing are used together by alternately lifting the object and placing cribbing materials underneath the lifted edge to stabilize it. Safety is number 1: "Lift an inch; crib an inch."

- Caution that leveraging and cribbing should be gradual—both for stability and to make the job easier. It may also be necessary to use leveraging and cribbing at more than one location (e.g., front and back) to ensure stability.

- Warn the participants that when they are able to achieve sufficient lift, they should remove the victim and reverse the leveraging and cribbing procedure to lower the object. Tell them to *never leave an unsafe condition.*

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	CREATING A SAFE ENVIRONMENT (Continued) ▪ Tell the group that when they must remove debris in order to locate victims, they should set up a human chain and pass the debris from one person to the next. Caution them, however, to set up the chain in a position that will not interfere with rescue operations. Also, remind them to wear leather gloves to protect their hands. **SUMMARY AND TRANSITION** ▪ Ask the participants if anyone has any questions about conducting rescue operations.
? *Discussion question.*	▪ Ask the group several "What would you do if . . ." questions to ensure that they understand the material. When asking the questions, set up a brief scenario and ask what the participants would do in that situation. ▪ Once it is clear that the participants understand the concepts of conducting rescue operations, tell them that the next topic will be removing victims.
YOUR NOTES:	

INSTRUCTORS NOTES

CONTENTS/ACTIVITY

Participant Handbook, page PH V-26.

Visual 5.22

Removing Victims

Types of victim removal include ...

- **Self-removal or assist**
- **Lifts and drags**

Allow victims to extricate themselves when possible.

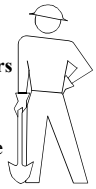
Visual 5.22

Visual 5.23

Extrication Method

Depends upon ...

- **Number of rescuers available**
- **Strength and ability of rescuers**
- **Condition of victim**
- **General stability of immediate environment**



Visual 5.23

REMOVING VICTIMS

- Introduce this section by explaining that there are two basic types of removal:
  - Self-removal or assist.
  - Lifts and drags.
- Explain that it is usually best to allow an ambulatory victim to extricate himself or herself. Caution the group, however, that sometimes ambulatory victims are not as strong and uninjured as they think they are. Once free from entrapment, victims may need assistance to exit the structure.
- Warn the participants to use good judgment when deciding which of the other types of removal to use. The type of extrication method selected should depend on the:
  - Number of rescuers available.
  - Strength and ability of the rescuers.
  - Condition of the victim.
  - General stability of the immediate environment.
- Explain that the participants will learn the basic types of victim removal and will have the opportunity to practice some of the techniques.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	REMOVING VICTIMS (Continued)
Review the symptoms of head and spine injury if necessary.	▪ Caution participants that, if safety and time permit, they should not use lifts and drags to remove victims when closed head or spine injury is suspected. In such cases, the spine must be stabilized using a backboard. Doors, tables, and similar materials can be used as improvised backboards. Stress that the backboard must be able to carry the person, and that proper lifting techniques must be used. When moving victims, rescuers must use teamwork and communication, and keep the victim's spine in a straight line. Remember, rescuer safety and the condition of the building will dictate the approach.
Demonstrate this carry using a participant volunteer as the victim. Then have all participants who are physically able pair up and practice the carry themselves.	▪ Point out that there are several types of lifts and carries. For example, if some participants are physically able, they may use the one-person arm carry to lift and carry the victim themselves by: • Reaching around the victim's back and under the knees. • Lifting the victim while keeping the rescuer's back straight and lifting with the legs.
Demonstrate this lift using two instructors. Then have the participant pairs practice the lift.	▪ Tell the participants that another way for a single rescuer to lift a victim safely is by using the one-person pack-strap carry. Using this method, the rescuer should: • <u>Step 1</u>: Stand with his or her back to the victim. • <u>Step 2</u>: Place the victim's arms over the rescuer's shoulders and grab the hands in front of the rescuer's chest.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	REMOVING VICTIMS (Continued)
	• Step 3: Hoist the victim by bending forward slightly, until his or her feet just clear the floor.
Demonstrate this lift using a participant volunteer as the victim. Allow all participants who are physically able to practice the lift: divide the participants into groups of three (two rescuers and one victim), and rotate roles so that each person has a chance to try the two rescuer positions.	▪ Explain that victim removal is easier when multiple rescuers are available. With two rescuers, a victim may be removed using a two-person lift—also called the "Georgia Street Carry":
	• Rescuer 1: Squat at the victim's head and grasp the victim from behind around the midsection. Reach under the arms and grasp the victim's forearms.
	• Rescuer 2: Squat between the victim's knees, facing either toward or away from the victim. Grasp the outside of the victim's legs at the knees.
	• Both rescuers: Rise to a standing position, keeping backs straight and lifting with the legs. Walk the victim to safety.
 *Participant Handbook, page PH V-29.*	Refer the participants to their Participant Handbooks for an illustration of this two-person lift.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	REMOVING VICTIMS (Continued)
Demonstrate this carry using two instructors as rescuers and a volunteer participant as a victim. Then have all participants who are physically able practice the carry, working in the same three-person groups.	▪ Demonstrate that two rescuers can also remove a victim by seating him or her on a chair: • Rescuer 1: Facing the back of the chair, grasp the back uprights. • Rescuer 2: Facing away from the victim, reach back and grasp the two front legs of the chair. • Both rescuers: Tilt the chair back, lift, and walk out.
Ask participants to volunteer to demonstrate the blanket carry. Make sure all participants have an opportunity to practice using the carry.	▪ Tell the participants that they can use the blanket carry for victims who cannot be removed by other means. Caution the participants that the blanket carry requires at least six rescuers to ensure stability for the victim and that one rescuer must be designated the lead person: • Step 1: Lay a blanket next to the victim. • Step 2: Tuck the blanket under the victim, and roll the victim into the center of the blanket. • Step 3: With three rescuers squatting on each side and grasping a "handle," the lead person checks the team for even weight distribution and correct lifting position. • Step 4: The lead person calls out, "Ready to lift on the count of three: one, two, three, *lift.*" • Step 5: The team lifts and stands in unison—keeping the victim level—and carries the victim feet first.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY

REMOVING VICTIMS (Continued)

Point out that the team must also lower the victim together, using the following steps:

- Step 1: The lead person calls out, "Ready to lower on the count of three: one, two, three, *lower*."
- Step 2: The team lowers the victim in unison, exercising caution to keep the victim level.

Demonstrate how to make an improvised stretcher using two poles and two jackets.

- Explain that a variety of materials—such as blankets or clothing—can be used as improvised stretchers.

Participant Handbook, page PH V-32.

- Point out that rescuers can also drag a victim out of a confined area by grasping either under the arms or by the feet and pulling across the floor. (Refer the participants to their Participant Handbooks for an illustration.) Caution the participants, however, that unless there is no other way to remove the victim and the victim's removal is time critical, they should not use this drag when debris may cause additional injury.
- Explain also that when need be, one rescuer can use the blanket drag by following these steps:
  - Step 1: Wrap the victim in a blanket.
  - Step 2: Squat down and grasp an edge of the blanket.
  - Step 3: Drag the victim across the floor.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	SUMMARY AND TRANSITION
? *Discussion question.*	▪ Ask the participants if anyone has any questions about rescue operations or victim removal. ▪ Explain that the participants will now have an opportunity to practice some of the victim removal techniques.
YOUR NOTES:	

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
 *Total Exercise: 20 minutes*	**EXERCISE: REMOVING VICTIMS** Instructor Note: This exercise will provide the participants with an opportunity to practice the removal of victims from a collapse situation, using leveraging/cribbing and drags and carries. The participants will be divided into groups and assigned to do a room search, locate victims, and remove the victims. By using two or three rooms simultaneously, so that there are several "rescues" occurring at once, a more realistic scenario can be created. Use the following steps to facilitate this exercise:
 *Divide participants into groups.*	1. Divide the participants into groups of six. Ask two members of each group to be victims first.
	2. Arrange the victims at the collapse site(s), using desks, shelves, etc., to represent debris. Place other items haphazardly around the victims. Make sure that there are items available that can serve as levers (e.g., 2 x 4's) and fulcrums.
Instructors should observe each group and correct errors that they see.	3. Instruct the groups to enter their respective "collapse site" rooms, do a room search, locate the victims and use leveraging and cribbing procedures to free them, and use appropriate lifts and drags to remove the victims from the room (and, if possible, from the building).
	4. Have the teams rotate roles so that there are two new victims. Rearrange the victims and "debris," and repeat the exercise until each participant has had an opportunity to practice being a rescuer.
? *Discussion question.*	5. Discuss the exercise with the entire group, focusing on any differences between the teams' techniques and experiences.

LIGHT SEARCH AND RESCUE OPERATIONS

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
 *Total Topic: 5 minutes*	**SESSION SUMMARY**
 *Present key points.*	▪ Summarize the key points in this session: • Search and rescue are two different activities that must be planned carefully and practiced in advance. The decision to attempt a rescue should be based on: - The risks involved. - Achievement of the overall goal of doing the greatest good for the greatest number. • The objectives of search and rescue are to: - Maintain rescuer safety at all times. - Rescue the greatest number of people in the shortest amount of time. - Rescue the lightly trapped victims first. • Remind the participants that CERTs are restricted to *light search and rescue*. Their mission when dealing with heavily damaged structures or situations that are clearly unsafe (e.g., rising or swiftly-moving water) is to: - Isolate the area. - Warn others. • Search and rescue size-up follows the same process as does size-up for other CERT operations. Size-up continues throughout search and rescue efforts and provides information about how to proceed. Should size-up indicate that evacuation is necessary, the CERT mission is to ensure safety and organization during the evacuation.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY

SESSION SUMMARY (Continued)

- Once the decision to begin search operations is made, CERT searchers must:

  - Locate potential victims.
  - Employ appropriate search techniques.

  Locating victims means completing a "mini-size-up" to identify areas of entrapment, then conducting a search that:

  - Is systematic and thorough.
  - Avoids unnecessary duplication of effort.
  - Documents results.

- Rescue involves three main functions:

  - Creating a safe environment.
  - Triaging or stabilizing victims.
  - Removing victims.

- Rescue operations hinge on maintaining rescuer safety, which requires CERT members to recognize their own limitations. CERT members should *never* attempt anything that exceeds their limitations *at that point in time.*

- Leveraging and cribbing may be used to remove debris and give access to trapped victims.

INSTRUCTORS NOTES	CONTENTS/ACTIVITY
	SESSION SUMMARY (Continued) • Victims can be removed in a number of ways, depending on their condition, the number of rescuers available, the strength and ability of the rescuers, and the stability of the environment. Remind the participants of the lifts and drags that they found easier to accomplish and suggest that they use those drags and carries when circumstances permit. • If building condition allows, victims with suspected head or spine injury should be stabilized on some type of backboard before being removed. If possible these removals should be deferred to trained EMS personnel.
? *Discussion question.*	▪ Ask the participants if anyone has any questions about anything covered in this session. ▪ Ask the group to read and become familiar with Chapter VI: Disaster Psychology And Team Organization before the next session. ▪ Thank the participants for attending the session. Remind them of the time and location of the next session, if necessary.
YOUR NOTES:	

ADDITIONAL MATERIALS
SESSION V

LIGHT SEARCH AND RESCUE OPERATIONS

Scenario V-1

At 10:00 on Tuesday, August 9, an earthquake (magnitude 5.9) shook Memphis, Tennessee. During the quake, the electricity in your neighborhood went out. On the way to the staging area at the local high school, you notice considerable damage, including several broken water mains, building collapses, and what looks like heavy structural damage in a local strip shopping center. When you arrive at your staging area, you can see that the west wing of the elementary school has partially collapsed.

Discuss the scenario with the group to answer the following questions:

- What does this scenario tell you about the probable density for the affected area?
- What kinds of search and rescue operations are probable?
- What, if any, are the constraints that search and rescue personnel may face in this scenario?
- Can these constraints be overcome within the established CERT mission? If so, how?

Scenario V-2

After reaching the staging area, you check in with the Logistics Team Leader, who assigns you to search and rescue team 2. Although CERT teams cannot venture into the section of the school building that has collapsed, search and rescue team 2 will be searching part of the east wing of the building to determine if there are victims in that area. Because your child once attended the school, you know that the building is heated by natural gas. You also remember that a storage shed for the school district's tractors is located about 50 feet outside the east wing of the school.

Discuss the scenario with the group to answer the following questions:

- What does this scenario tell you about the facts that must be gathered?
- What impact could these facts have on search and rescue operations?

Leveraging/Cribbing Operation

1. Conduct a size-up of the scene: gather facts, identify hazards, and establish priorities.

2. Have one person in charge and formulate a plan of action based upon the information you have received. Identify how and where to lift and crib.

3. Gather necessary materials for lifting/cribbing operations: lever, fulcrum, cribbing blocks, spacers/wedges.

4. Use cribbing materials to stabilize the object prior to lifting. (Set the foundation of the box crib.)

5. Distribute crib materials as necessary to be readily accessible during the lifting operation.

6. Prepare to lift the object: assemble the lever and fulcrum at the previously identified location.

7. Have someone available to handle the victim.

8. Initiate the lift, using the lever and fulcrum for mechanical advantage.

9. As the object is lifted, add cribbing as needed; build on the foundation of the box crib.

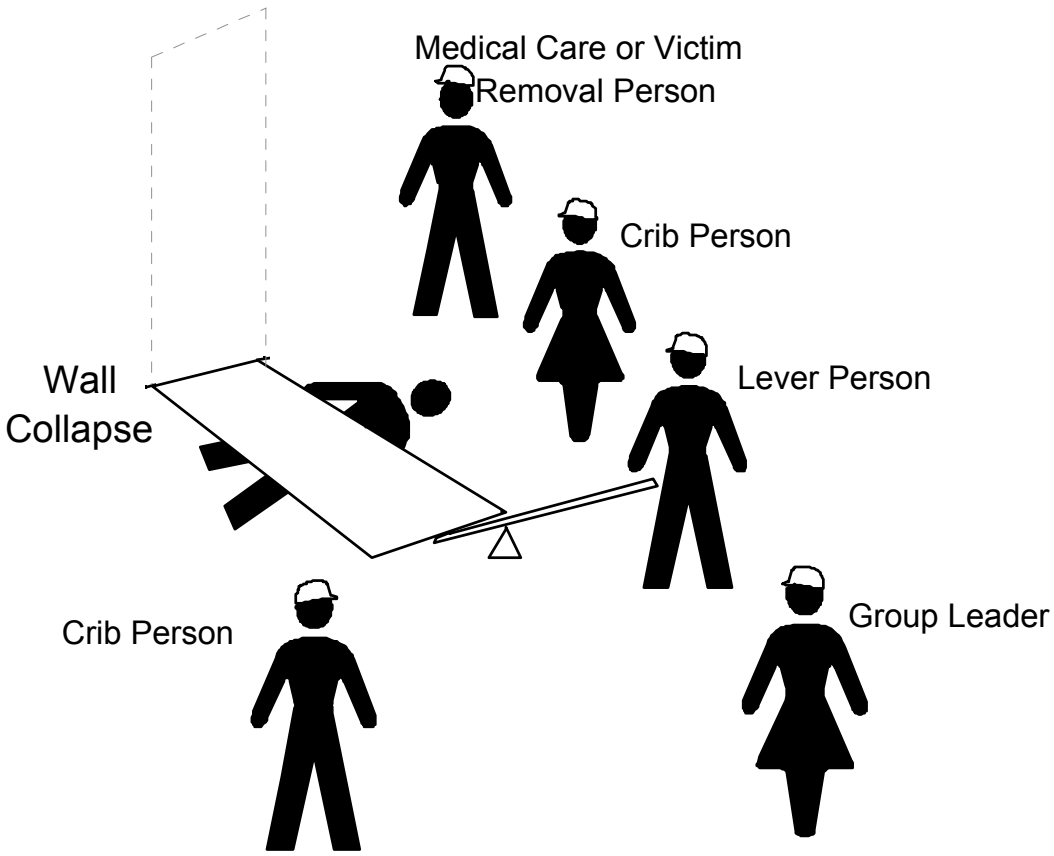
10. When the object is adequately supported, remove the lever and fulcrum. The victim may then be removed.

11. Reinitiate the lift and begin removing cribbing materials, reversing the process by which the crib was built.

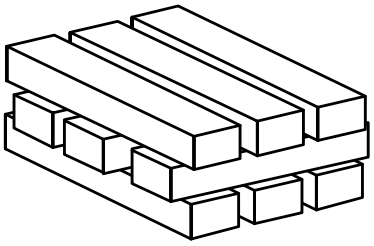
12. Progressively lower the object to the ground.

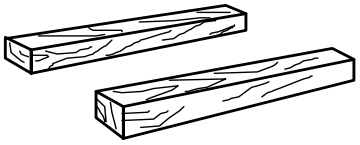
13. Reassemble the lifting/cribbing supplies to be available for additional operations.

Arrangement For Leveraging/Cribbing Operation

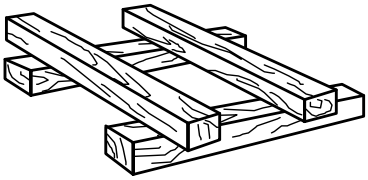


Box Cribbing

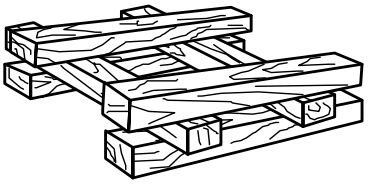




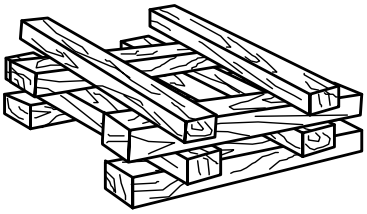
Step 1



Step 2



Step 3



Step 4